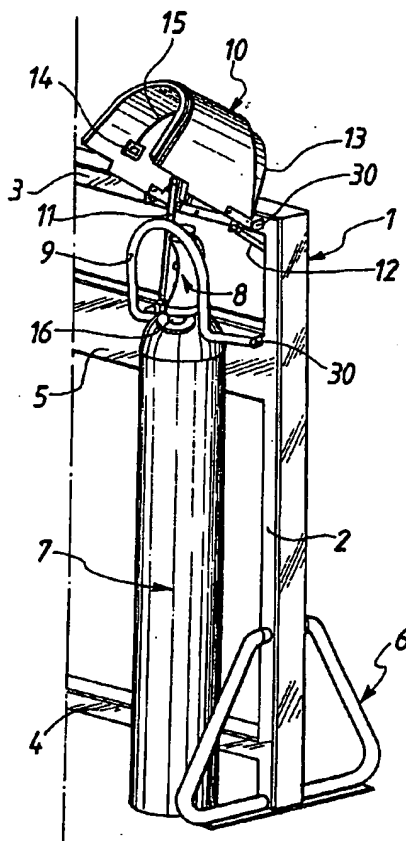




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(54) **INSTALLATION POUR STOCKAGE ET RETENUE DE
BOUTEILLES A GAZ**
(54) **INSTALLATION FOR STORING AND HOLDING GAS
CYLINDERS**



(57) The installation comprises, along a vertical frame (1), locations for gas cylinders, these locations advantageously being partially defined by a rack that can be used for transporting the cylinders (7), each location comprising, on the frame, a holding device (9,10) that can be swung between a lockable closed configuration preventing the insertion or extraction of a cylinder, and an open configuration. Application to automated stations for exchanging cylinders of industrial gases.

ABSTRACT

The installation comprises, along a vertical frame (1), locations for gas cylinders, these locations advantageously being partially defined by a rack that can be used for transporting the cylinders (7), each location comprising, on the frame, a holding device (9,10) that can be swung between a lockable closed configuration preventing the insertion or extraction of a cylinder, and an open configuration.

Application to automated stations for exchanging cylinders of industrial gases.

Figure 2 to be reproduced.

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Installation for storing and holding gas cylinders

The present invention relates to installations for storing and holding gas cylinders, more particularly of the type comprising at least two locations for accommodating cylinders, each location being provided with a holding device that can be moved between an open configuration, giving access to and from the location, and a closed configuration preventing access to and especially extraction of a cylinder from the temporary-storage location and its return to a location.

Installations of this type are described in Patent Application PCT/FR97.02239 in the name of the applicant company, the content of which is incorporated herein for reference.

This patent application is intended to propose new improved installations of simplified structure and operation and with better reliability and security.

To achieve this, according to one feature of the invention, each holding device comprises at least one structure having at least one enveloping profile which can be rotated about at least one axle between the closed configuration and an open configuration releasing the cylinder, the structure comprising at least one hoop which passes around the body of the cylinder in the closed configuration.

According to other features of the invention:

- the structure includes a part in the form of a substantially semicylindrical or prismatic hood for enclosing at least the head of the cylinder in the closed configuration,

- the axle is vertical or horizontal,
- the holding devices are mounted on a common frame, typically vertical and substantially flat, advantageously including adjacent cylinder-holding locations on at least one of its vertical faces.

According to other aspects of the invention,

- the accommodating locations are at least partially defined by a removable rack, advantageously

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including means for co-operating with a lifting/transporting device, and used for transporting, positioning in place and taking away a set of cylinders,

5 - each holding device includes an electronic device for conversing with an electronic tag borne by the cylinder, the electronic device typically including an antenna mounted on a moving part of the holding device.

10 Other features and advantages of the present invention will emerge from the following description of one embodiment, given by way of illustrative but non-limiting example, made with reference to the appended drawings, in which:

15 - Figure 1 is a partially cutaway perspective view of one embodiment of an installation according to the invention;

 - Figure 2 is a view of an alternative form showing the hood and the hoop in the open position; and

20 - Figure 3 is a diagrammatic plan view of another embodiment of the invention.

In the description which will follow and in the drawings, elements which are identical or similar bear the same reference numerals, possibly with a suffix.

25 The installation for storing and holding gas cylinders, depicted in Figure 1, includes, in general, a metal frame 1 which is lightweight and can be transported onto site, of rectangular and essentially flat configuration, consisting of a pair of vertical
30 uprights 2, an upper crossmember 3, a lower crossmember 4 and an intermediate crossmember 5. The uprights 2 at their base have cross-bracing or a tripod 6 for making them more rigid and for mounting them on a floor covering.

35 The frame 1 is sized, in terms of height and in terms of width, so that a certain number, depending on their size and capacity, of gas cylinders 7, each comprising a head 8 consisting of a gas valve assembly

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and of a bonnet for protecting this valve can stand up against it.

As can be seen in Figure 1, associated with each cylinder location along the frame 1 is a holding
5 device that can be swung vertically about a horizontal axle 30 and which consists of a combined assembly of a retaining hoop 9 which passes around the cylinder substantially in its upper third, and a hood or cap 10 which covers the top of the cylinder and, in the closed
10 position, completely encloses the head 8, preventing any access thereto. The hoop 9 and the hood 10 swing simultaneously, forming a single assembly, as depicted in Figure 1, or two assemblies articulated about separate horizontal axles, coupled together by at least
15 one link rod 11, as depicted in Figure 2, to open and close simultaneously, opening advantageously being assisted, for example, by a gas spring 12 bearing against the frame 1. In the embodiment of Figure 1, the hoop 9/hood 10 assembly is mounted articulated on the
20 upper crossmember 3 by the ends of the lateral arms of the hoop 9 and the spring 12 acts on one arm of the hoop. In the embodiment of Figure 2, the hoop 9 is mounted articulated, by the ends of its lateral arms, which in this case are shorter, on the intermediate
25 crossmember 5, the hood 10 being mounted articulated, by its top corners, on the upper crossmember 3. In the embodiment of Figure 2, the assistance spring 12 acts on the hood 10.

As a general rule, the hoop 9 has, when viewed
30 face on, the overall configuration of a U, the width between the branches of the U corresponding to the diameter of the cylinder 7, and, when viewed side on, the configuration of an open L, to allow it to clear the head 8 of the cylinder when in the open
35 configuration. The hood 10 has a semicylindrical overall configuration which is closed at its upper part by an inclined roof part 13. Advantageously, the hood 10 forms a continuous unperforated shell made of technical-grade plastic. As depicted in Figure 2, it

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advantageously has, on its internal face, an electronic circuit 14 associated with an antenna 15 running along the hood 10 to read, or preferably converse with, an electronic tag 16 fixed to the neck of the cylinder 7 when this cylinder is equipped with such identification and tracing means. The antenna alone may be mounted on the internal face of the hood 10, or in the hoop 9, by being connected to a circuit 14 mounted stationary in a unit on the frame 1.

As described in the aforementioned document PCT/FR97.02239, the hoop 9 and hood 10 gear includes means capable of co-operating with an electromagnetic catch borne by the frame to selectively allow the assembly to be opened and/or closed as a function of access-clearance sequences described in the aforementioned document. Typically, as illustrated schematically in Figure 1, one of these elements 9 and 10 includes a bolt element which can be inserted in a keeper 17 of an electromagnetic catch (not depicted) mounted on the frame 1.

The cylinders 7 may be placed directly on the floor covering of the frame 1, as depicted in Figure 2, the sizes and positions of the hoop 9 and of the hood 10 preventing any extraction of the cylinder from its housing by tilting it when the hoop and the hood are lowered. Advantageously, according to one aspect of the invention, the cylinders 7 are arranged in housings of a rack 18 of L-shaped overall configuration which can be housed along one of the vertical faces of the frame 1, resting on the floor covering. The rack 18 includes a baseplate 19, forming the short leg of the L, on which the cylinders 7 rest, these being held laterally by end plates 20 and the lateral faces of a U-shaped section piece 21, the horizontal bottom parts of which form tunnels 22 the size of the forks of fork-lift trucks for transporting and installing the rack equipped with these cylinders, the latter typically being held in place in the rack during transport and handling by straps (not depicted) passing through

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runners 23 of the rack 18. As can be seen in Figure 1, each frame 1 advantageously accommodates a rack 18 on each of its vertical faces, one of the racks being full of full cylinders to be taken away, the other empty to
5 receive empty cylinders to be exchanged according to the procedures described in the aforementioned document PCT/FR97.02239.

In the embodiment depicted in Figure 3, there can be seen, in plan view, the frame 1 with, one on
10 each side, two cylinders 7. In this embodiment, the structure with the enveloping profile comprises a semicylindrical hood 10 with a roof part 13 supported in rotation about a vertical axle 31 substantially concentric with the cylinder 7 in position in its
15 housing, on a lug 32 which projects laterally from the upper crossmember 3. The solid side wall of the hood 10 is extended in the direction beyond the axle 31 by a lug 24 forming the bolt which can be inserted in the keeper of the electromagnetic catch 25 borne by the
20 frame 1 in the closed configuration depicted in the left-hand part of Figure 3. In the open configuration, which is depicted in the right-hand part of Figure 3, the hood 10 is rotated to the rear, about the axle 31, to become partially housed in the frame 1 until it
25 reaches a wide open configuration which is defined by a projection 26 of the hood 10 coming into abutment against the frame 1. In an alternative version of the embodiment of Figure 3, the holding device may, in addition to the hood 10, comprise a filiform hoop which
30 passes around an intermediate part of the cylinder, moving about a vertical axis concentric with the cylinder or offset from the axis of the cylinder, the hood 10 in this case advantageously also being mounted to rotate about a vertical axis which is also offset
35 from that of the cylinder and close to the axis of the hoop if the latter and the hood remain coupled.

Although the present invention has been described in conjunction with particular embodiments, it is not restricted thereto but on the contrary can be

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modified and varied in ways which will be obvious to the person skilled in the art in the context of the claims which follow.

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CLAIMS

1. Installation for storing and holding gas cylinders, comprising at least two locations for accommodating cylinders (7), each location being
5 provided with a holding device that can be switched between an open configuration and a closed configuration, characterized in that the holding device comprises at least one structure with an enveloping profile which can be rotated about at least one axle
10 (30;31) between a closed configuration and an open configuration releasing the cylinder, the structure comprising at least one hoop (9) which passes around the body of the cylinder (7) in the closed configuration.
- 15 2. Installation according to Claim 1, characterized in that the structure includes a part in the form of a substantially semicylindrical or prismatic hood (10) enclosing at least the head (8) of the cylinder in the closed configuration.
- 20 3. Installation according to one of Claims 1 and 2, characterized in that the axle (31) is vertical.
4. Installation according to one of Claims 1 and 2, characterized in that the axle (30) is horizontal.
5. Installation according to one of the preceding
25 claims, characterized in that the holding devices (9,10) are mounted on a common frame (1).
6. Installation according to Claim 5, characterized in that the frame (1) is vertical.
7. Installation according to Claim 6,
30 characterized in that the frame (1) is substantially flat and includes adjacent locations on at least one of its vertical faces.
8. Installation according to one of Claims 5 to 7, characterized in that the frame (1) is transportable.
- 35 9. Installation according to one of the preceding claims, characterized in that the locations for accommodating cylinders are at least partially defined by a removable rack (18).

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10. Installation according to Claim 9, characterized in that the rack (18) includes means (22) for co-operating with a lifting/transporting device.

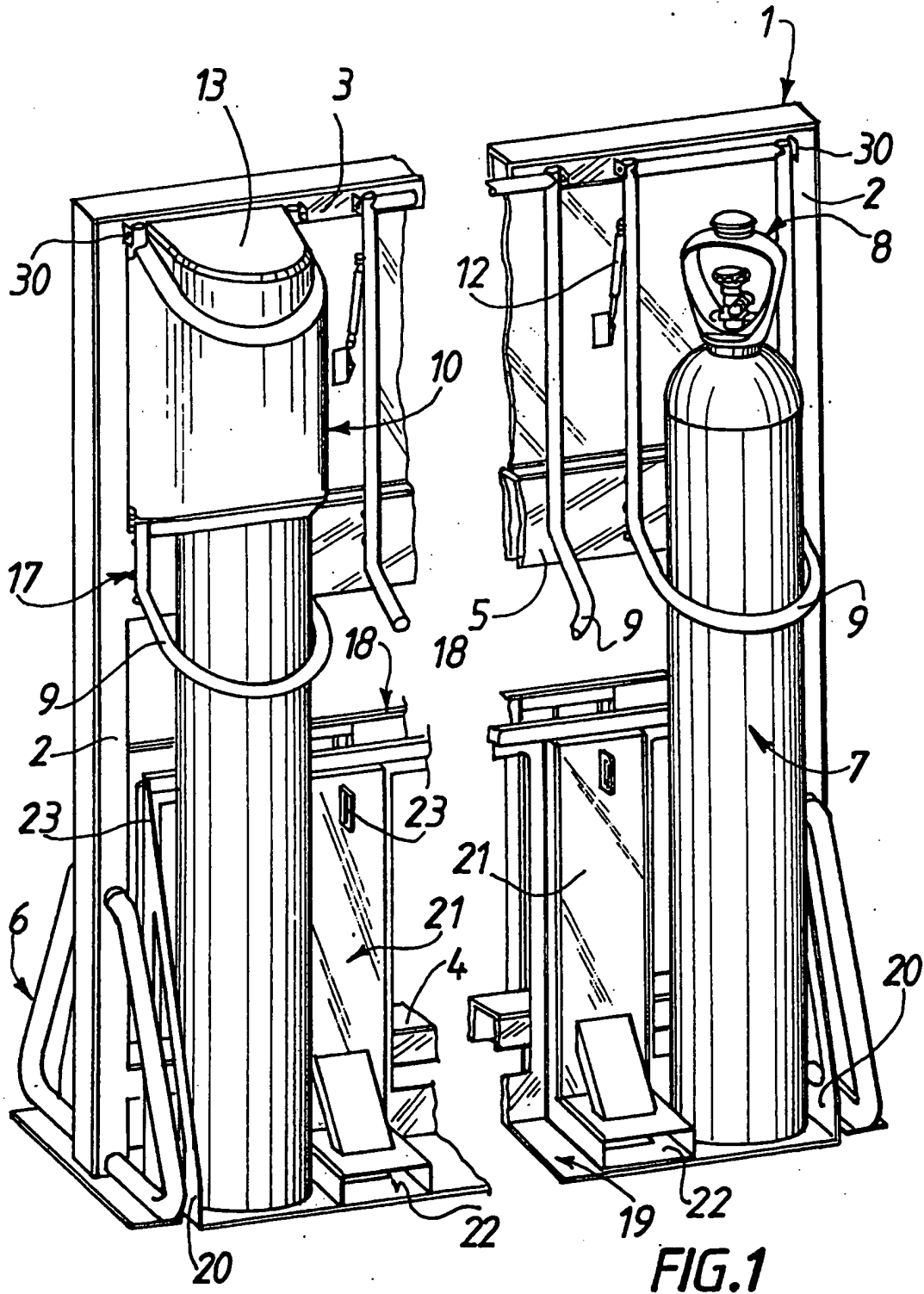
11. Installation according to Claim 9 or Claim 10,
5 characterized in that the rack (18) has an L-shaped overall configuration.

12. Installation according to one of the preceding claims, characterized in that the holding device includes an electronic device (14,15) for conversing
10 with at least one electronic tag (16) on the cylinder (7).

13. Installation according to Claim 12, characterized in that the electronic device comprises an antenna (15) mounted on a moving part (10) of the
15 holding device.

14. Installation according to Claim 13, characterized in that the antenna (15) is arranged in the structure (10,9) which has the enveloping profile.

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